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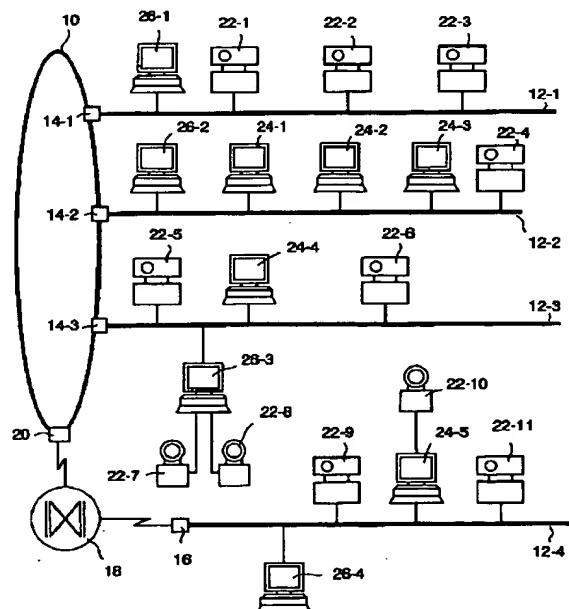
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(57) 【要約】

【目的】 任意のカメラからの映像を容易に得られるようにする。

【構成】 LAN10、12-1～12-4にコンピュータ24-1～24-5及び映像サーバ装置26-1～26-4を接続し、複数のカメラ22-1～22-11をLAN12-1～12-4に直接、若しくは、コンピュータ24-5又は映像サーバ装置26-3を介して接続する。カメラ22-1～22-11には、映像送信元を検出する手段と、検出された要求元に撮影画像の圧縮データを送信する送信手段を設ける。また、カメラ22-1～22-11に、映像送信要求の要求元に応じて、コンピュータ24-1～24-5毎に予め設定された撮像領域にパン、チルト及びズームして、撮影する制御手段を設ける。更に、カメラ22-1～22-11に、コンピュータ24-1～24-5からの制御権要求を排他制御する制御手段を設ける。



* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the network system which connects organically one or more sets of two or more image pick-up equipments and the information machines and equipment possessing a graphic display means.

[0002]

[Description of the Prior Art] In recent years, image transmission media, such as a coaxial cable or an optical fiber, are spread around, and the image transmission system (for example, CCTV (closed circuit television) system) which selection, compounds and displays [change] two or more camera inputs came to be used as small-scale monitoring system for a convenience store or an apartment house only as large-scale monitoring system, such as a big building and a bank.

[0003] It is common that are installed in every place, and switch and many cameras display the photography image on the monitor display of a monitor pin center,large simultaneous in such monitoring system. Drawing 2 shows the outline configuration block Fig. of the conventional monitoring system. 310-1,310-2,310-3, ..., 310-n are surveillance cameras installed in each location, and are connected to each input port of the video switcher 314 through the interconnection cable 312 which consists of the coaxial cable for images or a fiber-optic cable, and a cable for power control signals. The photography image of each surveillance camera 310-1,310-2,310-3, ..., 310-n is supplied to the video switcher 314 through a cable 312.

[0004] The video switcher 314 supplies the image from which a surveillance camera 310-1,310-2,310-3, ..., 310-n were chosen as the bottom of control of a controller 316 to a monitor 318 and/or a timelapse VTR 320. According to directions of an operator, a controller 316 controls the graphic display in the video switcher 314 and/or selection of the image which should be recorded, and composition, controls photography bearing, a scale factor, etc. of each surveillance camera 310-1,310-2,310-3, ..., 310-n, and controls actuation of VTR320. A monitor 318 consists of two or more display units. With each display unit, although two or more photography images (for example, the multi-screen of 2x2 four photography images) can be displayed on coincidence with a multi-screen, suppose that a number of display units which constitute it are prepared in a multi-screen on these specifications. For example, the multi-screen of 2x2 consists of four display units.

[0005] Power control 322 supplies a power source to a surveillance camera 310-1,310-2,310-3, ..., 310-n, the video switcher 314, a monitor 318, and VTR320, and controls the current supply.

[0006] The video switcher 314, a monitor 318, VTR320, a controller 316, and power control 322 are installed in a central monitor pin center,large. Since a surveillance camera 310-1,310-2,310-3, ..., 310-n are installed in every place so that the candidate for a monitor can be photoed, a cable 312 will be arranged between the installation of a surveillance camera 310-1,310-2,310-3, ..., 310-n, and a monitor pin center,large.

[0007] Thus, in the conventional monitoring system, the same axle/fiber optic cable for image transmission are installed between a surveillance camera and a monitor pin center,large, and the image from the camera of arbitration or the image from all cameras is displayed on monitor display in a monitor pin center,large.

[0008] Including the real-time transmission function of an image in a computer network is considered to the conventional image transmission system which uses the exclusive cable of image transmission. It can talk with the coworker or guest who is present in another room thereby, for example as if it was in the same location, and it can check now with a camera image whether a coworker is present at another room. Moreover, the situation of other locations, for example, a dining-room, can be crowded, and condition etc. can be easily checked now on the monitor display of its own computer.

[0009] It prepares for real-time transmission of the image, speech information, etc. of increase of a communications traffic, and future, and large-capacity-izing and improvement in the speed of a computer network are attained. As current and a base LAN, there are ATM (Asynchronous Transfer Mode) LAN, a FDDI (Fiber-Distributed Data Interface)-LAN, etc., and the high-speed transmission of 100 Mb/s - 155 Mb/s is possible in these. The standardization of a twisted pair LAN etc. whose branch line system also realizes 100 Mb/s is advanced. By the public network system, advice-ization of B1ISDN (broadband ISDN) is attained, the experiment of the ATM communication link on CATV etc. is beginning to be conducted briskly, and a high-speed network environment is being gradually improved as a communication link infrastructure.

[0010] moreover -- About the video camera as an image input means, the various cameras for the purpose of computer connection are being ****(ed) at a low price by using the DTV (DeskTop Video-Conferencing) commercial scene by future personal computer or workstation (it being hereafter named computer generically.) as a target.

[0011] As everyone knows, when the image quality is maintained and the image of standard television specification, such as NSTC/PAL, is digitized, the transmission rate of 100 or more Mb/s is required, and it needs 64 kb/s similarly only by PCM-izing speech information at about 3.4MHz of voice grade. Therefore, a data compression is usually carried out and it is transmitted.

[0012] Various methods are proposed by the digital compression technology of image information. For example, there is a JPEG coding method by the still picture compression system. In the MPEG1 (1.5 or less Mb/s) coding method and communication system which were suitable for are recording by the animation compression system The H.261 coding method for narrow band ISDNs (64 kb/s - 2 Mb/s), The object for are recording which covers from the image quality corresponding to Hi-Vision to image quality equivalent to the present television image quality, and the MPEG 2 (several Mb/s - dozens M/b) coding method corresponding to both for an ATM communication link, There is an MPEG4 coding method for the transmission rate (9.6 kb/s - 28.8 kb/s) guaranteed with analog telephone line extent.

[0013] About speech information, coding methods, such as ADPCM (32 or less kb/s) which compresses more into a low bit rate the G.722 or 3.4kHz voice grade guaranteed to a 7kHz band, and LD-CELP (16 kb/s), are standardized.

[0014]

[Problem(s) to be Solved by the Invention] In the image transmission system which uses an exclusive cable for image transmission, it is unsuitable for an application to connect many cameras and many monitors to organically if needed.

[0015] On the other hand, the ED about a computer network, a camera, an image, and audio compression technology cannot deny the feeling of individual precedence-approach which glared at the future, but has conceived various problems in the actual system construction. For example, since many of transmission capacity will be consumed for transmission of animation image information even if it has carried out compression coding on LAN which current installation is carried out and is used although spread and maintenance of a computer network environment are remarkable and the high-speed base LAN is accelerated in the utilization arrival fruit, other use is barred. Moreover, a means to guarantee transmission capacity and a time delay is needed.

[0016] This invention connects organically at least one set of many cameras and the information machines and equipment possessing a graphic display means, and aims at showing the network system which can display the image of the camera of arbitration on the graphic display means of arbitration.

[0017] This invention aims at showing the network system which can operate the camera of arbitration by remote control again.

[0018] This invention aims at showing the network system which possesses the function which controls the camera of arbitration to a desired control state again.

[0019] This invention aims at showing the network system which enabled it to judge further the part in which a camera should be installed easily.

[0020]

[Means for Solving the Problem] Two or more image pick-up equipments with which the network system concerning this invention can change either [at least] photography bearing or a photography scale factor freely, It is the network system which connects one or more sets of the information machines and equipment possessing the graphic display means concerned mutually. The image pick-up equipment concerned A requiring agency detection means to receive the image Request to Send from the information machines and equipment concerned, and to detect the demand origin, It is characterized by having bearing and a scale-factor adjustment means to adjust photography bearing and a photography scale factor to the image pick-up field beforehand set up according to the demand origin detected by the requiring agency detection means concerned, and a transmitting means to transmit a photography image to the demand origin concerned.

[0021] Two or more image pick-up equipments with which the network system concerning this invention can change either [at least] photography bearing or a photography scale factor freely again, It is the network system which connects one or more sets of the information machines and equipment possessing the graphic display means concerned mutually. The image pick-up equipment concerned An image storage means to take a photograph in order of assignment about two or more image pick-up fields set up beforehand, and to accumulate the photography image, A requiring agency detection means to receive the image Request to Send from the information machines and equipment concerned, and to detect the demand origin, It is characterized by having a transmitting means to read the photography image of the image pick-up field beforehand set up according to the demand origin detected by the requiring agency detection means concerned from the image storage means concerned, and to transmit to the demand origin concerned.

[0022] Two or more image pick-up equipments with which the network system concerning this invention can change either [at least] photography bearing or a photography scale factor freely again, It is the network system which connects one or more sets of the information machines and equipment possessing the graphic display means concerned mutually. The image pick-up equipment concerned It carries out providing a control demand receiving means to receive the control demand from the information machines and equipment concerned, a requiring agency detection means to detect the demand origin of the control demand concerned, and the control management tool that sets a control as the demand origin only when the control demand concerned includes predetermined information as the description.

[0023] The network system concerning this invention is the network system which connects one or more sets of two or more image pick-up equipments and the information machines and equipment possessing the graphic-display means concerned mutually again, and each image pick-up equipment is characterized by to have an image transmitting means transmit a photography image to a requiring agency, and a storage means count the count of an image Request to Send in the predetermined classification for every requiring agency and every transmitting conditions, and memorize image Request-to-Send logging to an image Request to Send.

[0024] The image pick-up equipment of plurality [network system / concerning this invention] again, and the image server equipment which carries out package management of two or more image pick-up equipments concerned, It is the network system which connects one or more sets of the information machines and equipment possessing a graphic display means mutually. The image server equipment concerned A Request-to-Send processing means to receive an image Request to Send and to detect the demand origin, It is characterized by providing an image transmitting means to transmit the photography image by the image pick-up equipment

concerned specified as the information machines and equipment concerned which required image transmission by the image Request to Send concerned by the image Request to Send concerned, and a storage means to memorize the demand origin of image transmission, and a count about each above-mentioned image pick-up equipment.

[0025]

[Example] Hereafter, the example of this invention is explained to a detail with reference to a drawing.

[0026] Drawing 1 shows the outline configuration block Fig. of one example of this invention. The base LAN which 10 becomes from the high speeds LAN, such as ATM-LAN and FDDI-LAN, 12-1, 12-2, 12-3, and 12-4 are the branch lines LAN which consist of LANs, such as Ethernet and a token ring. A branch line LAN 12-1, 12-2, and 12-3 connect with a base LAN 10 by the router / brouter 14-1, 14-2, and 14-3, respectively, and a branch line LAN 12-4 is connected to a base LAN 10 through the communication line 18 which consists of a public line network or dedicated lines, such as a router / brouter 16, and B-ISDN, and the router/brouter 20.

[0027] The video camera for an image input, 24-1, 24-2, 24-3, 24-4, and 24-5 22-1, 22-2, ..., 22-11 The computer placed on the desk, 26-1, 26-2, 26-3, and 26-4 are image server equipment which carries out jurisdiction control of the camera connected to each branch line LAN 12-1, 12-2, 12-3, and 12-4 (or self), respectively.

[0028] A computer 24-1, 24-2, and 24-3 are connected to a branch line LAN 12-2, it connects with a branch line LAN 12-3, and a computer 24-4 connects a computer 24-5 to a branch line LAN 12-4.

[0029] It connects with a branch line LAN 12-1, and a camera 22-1, 22-2, and 22-3 are controlled by image server equipment 26-1. It connects with a branch line LAN 12-2, and a camera 22-4 is controlled by image server equipment 26-2. A camera 22-5 and 22-6 are connected to a branch line LAN 12-3, it connects with a branch line LAN 12-3 through image server equipment 26-3, and a camera 22-7 and 22-8 are controlled by image server equipment 26-3. A camera 22-9 and 22-11 are connected to a branch line LAN 12-4, it connects with a branch line LAN 12-4 through a computer 24-5, and a camera 22-10 is controlled by image server equipment 26-4.

[0030] Drawing 3 shows the outline configuration block Fig. of the graphic display processing part in a computer 24-1 to 24-5. The image composition processor with which the video decryption equipment which decrypts the coding video image which the CCE which controls the communication link whose 30 minded the connection with LAN 12-1 to 12-4 and LAN, and 32 received, and 34 overlay a receiving image on a graphic screen, and 36 are VRAMs which memorize the image data which should be displayed with the display monitoring device 38. It is the system control station which 40 consists of a hard disk drive unit, main memory, etc., and the storage which memorizes the image data which should be displayed on a graphic screen, and 42 consist of CPU, a ROM, and RAM, and controls the whole. Some or all of CCE 30, video decryption equipment 32, and the image composition processor 34 is realizable as software on CPU as everyone knows.

[0031] Through CCE 30, the coded-image data from LAN 12-1 to 12-4 are impressed to video decryption equipment 32, and are decrypted. The image composition processor 34 overlays the image data restored by video decryption equipment 32 on a graphic screen, and writes it in the appointed place (for example, location corresponding to the window assigned to the display) of VRAM36. The image data written in VRAM36 is read one by one, and image display is impressed and carried out to a monitor 38.

[0032] Drawing 4 shows the camera 22-1 to 22-6 which carries out direct continuation to LAN 12-1 to 12-4, 22-9, and the outline configuration block Fig. of 22-11. 50 changes an optical image into an electrical signal, is the image pick-up section outputted with the video signal of a predetermined format, and possesses the zoom lens for optical variable power. 52 supports the image pick-up section 50, and is the universal head which can rotate the photography bearing freely (a pan and tilt). A/D converter 54 changes the output video signal of the image pick-up section 50 into a digital signal, and the memory access-control circuit 56 carries out the temporary storage of the output data of A/D converter 54 to the video memory 58, and is

beginning to read them, and it supplies it to video coding equipment 60. Video coding equipment 60 encodes the video data from memory access-control equipment 56 by the predetermined coding method.

[0033] The communication controller which controls the communication link whose 62 minded the connection with LAN 12-1 to 12-4 and LAN, and 64 The requiring agency information on the control information sent through LAN 12-1 to 12-4 The requiring agency information detection supervisory equipment which detects and supervises (for example, the requiring agency address), the system control station with which 66 controls the whole, and 68 While memorizing the logging information and statistical information about sending out in LAN 12-1 to 12-4 of a photography image, it is the storage used for are recording storage of a photography image.

[0034] It cannot be overemphasized that some or all of video coding equipment 60, a communication controller 62, and requiring agency information detection supervisory equipment 64 is realizable with software.

[0035] It consists only of a part which is equivalent to the image pick-up section 50 and a universal head 52 in drawing 4 , and the function of the parts 54-68 of others which were illustrated to drawing 4 is realized for the camera 22-10 linked to the camera 22-7, 22-8, and the computer 24-5 linked to image server equipment 26-3 by image server equipment 26-3 and the computer 24-5.

[0036] All of cameras 22-1 to 22-11 or one or more can carry out external control of photography bearing and the photography scale factor. There are a pan which is rotation horizontal as photography bearing, and a tilt which is rotation of a perpendicular direction. A zoom is usually realized by rotating centering on an optical axis so that it may move the predetermined lens or predetermined lens group in a taking lens in the direction of an optical axis. The relation between a pan, a tilt, and a zoom is shown in drawing 5 . Drawing 5 is drawing which looked at the camera from the transverse plane.

[0037] With reference to drawing 6 and drawing 7 , modification of the photography field by controlling photography bearing and a photography scale factor is explained briefly. In drawing 6 , 110 is all the image pick-up fields that can be photoed at full using a pan, a tilt, and a zoom, and 112,114,116,118 shows the image pick-up field when setting a pan, a tilt, and a zoom as a specific value. As an image pick-up field shows a control value to drawing 7 by presetting and specifying in order, modification control of the pan and tilt which realize the image pick-up field 112,114,116,118, and the zoom is carried out cyclically.

[0038] Drawing 8 , drawing 9 , drawing 10 , and drawing 11 show the plot plan of a camera and a computer. In this example, there shall be a main building of 4 stories and an annex of 3 stories, and the camera 22-1 to 22-11 and the computer 24-1 to 24-5 shall be distributed by them. The side elevation of the building which drawing 8 shows camera arrangement, and drawing 9 are the side elevations of the building in which computer arrangement is shown. Drawing 10 is the top view of the second floor of a main building, and drawing 11 is the top view of the third floor of a main building. In drawing 8 - drawing 11 , with a circle [of void] shows a computer 24-1 to 24-5, and the black dot shows the camera 22-1 to 22-11. Moreover, in drawing 10 and drawing 11 , C 1-10 shows the identifier or the address of a camera, and P1-P9 show the identifier or the address of a computer.

[0039] The flow chart of the actuation which chooses an image, i.e., a camera, to display on monitor display is shown in drawing 12 . A user directs the display of the camera appointed screen to an own computer, and camera arrangement general drawing as shown in drawing 8 is displayed on monitor display according to this (S1). A user specifies the area in which the camera to choose is installed on the camera arrangement general drawing (S2). A computer displays the camera location detail drawing of the specified area (S3). For example, when the second floor of a main building is specified, a camera plot plan as shown in drawing 10 is displayed.

[0040] A user specifies one camera which should be chosen on camera location detail drawing (S4). For example, a mouse pointer is moved onto the icon which shows the target camera, and a mouse button is clicked.

[0041] After specifying one camera, transmitting conditions (for example, a frame rate, air time,

image size, and a coding method) are set up (6 S5, 7). When not carrying out especially setting actuation, default conditions (for example, one-frame transmission) are set up (S6). For example, one-frame image size is set to 320x240, when per minute two frames is encoded for 5 minutes and by the sequential JPEG coding method and it transmits, it is, and conditions [like] are set up.

[0042] After a setup of transmitting conditions, to the selected camera, an image Request-to-Send command including image transmitting conditions and the Request-to-Send former address is sent out (S8), and it waits for image reception (S9). Decrypting (S9) and receiving image data, if image reception is detected, the restored receiving image is overlaid to a graphic screen, and it displays on monitor display (S11). (S10)

[0043] Drawing 13 shows the operation flow chart by the side of the camera to an image Request-to-Send command. A camera is a default location (for example, mid gear in the range which can be photoed.) about a beginning and image pick-up field. Usually, it is made the transverse plane (S21) and waits for reception of an image Request-to-Send command (S22). In the meantime, as for this camera, it is desirable that it is the low-power mode by which current supply is carried out only to the part required for the reception of an image Request-to-Send command.

[0044] Demand former information is detected from an image Request to Send (S23), the existence of the image pick-up area set as the demand origin is investigated (S24), and the pan, tilt, and zoom of a camera are started to the corresponding location (S25). The conversion table of image pick-up area to each image Request-to-Send origin is beforehand memorized by the storage 68 of each camera, and can change serially.

[0045] The transmitting conditions to which it was added by waiting (S26) and the image Request to Send that photography bearing and a photography scale factor are set as a predetermined value are analyzed (S27). In fact, while controlling a pan etc., transmitting conditions are analyzed to coincidence. Video coding equipment 60 and a communication controller 62 are set up so that it may agree on the analyzed transmitting conditions.

[0046] It transmits to image Request-to-Send origin through LAN 12-1 to 12-4 with a communication controller 62, capturing the photography image by the image pick-up section 50 for every frame (S28), and encoding with video coding equipment 60 (S29). That is, the photography picture signal by the image pick-up section 50 is changed into a digital signal by A/D converter 54, and is supplied to video coding equipment 60 through the memory access-control circuit 56 and the video memory 58. Video coding equipment 60 encodes the video data from memory access-control equipment 56 according to the appointed transmitting conditions, and CCE 62 transmits coded data to image Request-to-Send origin through LAN 12-1 to 12-4.

[0047] When it should check whether transmission should be ended or not for every transmitting termination for one frame (S31) and transmission should be ended according to transmitting conditions, return and image pick-up area are returned to a default value S21 (S21), and it waits for the following image Request to Send (S22). When transmission should be continued, it waits for (S31) and transmitting initiation of the following frame (S32), and S28 and S29 are repeated.

[0048] Although the capture of a frame image, coding, and transmission are sequentially performed in drawing 13, this is for making an understanding easy and it cannot be overemphasized in the possible range that it is good in juxtaposition actuation.

[0049] Drawing 14 accumulates the photography image into the camera, and shows the flow chart of the actuation which transmits an are recording image to a requiring agency according to an image Request to Send.

[0050] Changing image pick-up area in order of assignment until it receives an image Request to Send (S41), a photograph is taken changing cyclically like area 112, area 114, area 116, area 118, and area 112, as shown in drawing 7, compression coding of the frame image of each image pick-up area is carried out, and it accumulates in storage 68 (S42-45). That is, it accumulates in storage 68, changing image pick-up area into the specified location of a degree (S42), waiting for termination of migration for it (S43), capturing the frame image by the image pick-up section 50 (S44), and encoding with video coding equipment 60 (S45). S42-45 are repeated until it receives an image Request to Send (S41). Of course, image pick-up area may be fixed and the

photography frame number in one image pick-up area can be set as arbitration. A frame rate, image size, compressibility, etc. are restricted by the capacity of storage 68.

[0051] If an image Request to Send is received (S41), demand former information will be detected (S46), the image pick-up area beforehand set up to the demand origin will be investigated (S47), and the coded-image data of the image pick-up area accumulated in the store 68 will be transmitted to a requiring agency (S48). If transmission is ended, it will return to S41.

[0052] Since it is easy, although [drawing 14] the image data of the image pick-up area specified beforehand are transmitted to a requiring agency, of course, a requiring agency can specify the image pick-up area of arbitration. The assignment information is transmitted to a camera together with an image Request to Send.

[0053] Next, the actuation at the time of controlling the camera of arbitration is explained. The flow chart of operation with which drawing 15 chooses a camera to operate by the computer side, and drawing 16 show the operation flow chart of the selected camera.

[0054] In a computer side, a camera to carry out motion control is first specified like S1 of drawing 12 - S4 (S51). Since the selected camera is also a camera which displays the image on monitor display, according to assignment of a camera, it transmits an image Request-to-Send command to the camera on continuous image transmitting conditions, and displays the image from the camera on coincidence continuously in monitor display.

[0055] Information (for example, a password, a control user name, etc.) required to acquire the right of remote operation is inputted (S52), and it sets up as requiring agency information (S53). To the specified camera, with demand former information, camera actuation directions are transmitted (S54) and it waits for the completion signal of the directions actuation from the camera (S55). Camera actuation directions consist of each desired value of a pan, a tilt, and a zoom.

[0056] With the signal from the camera for actuation, it checks whether it has terminated normally (S56). When having terminated normally (S56), S54-S56 are repeated until a user inputs termination of directions of operation (S57). When having not terminated normally (S56), an error to that effect is displayed and it ends (S58).

[0057] Although directions of operation were described by drawing 15 in order to make an understanding easy, it is needless to say and it necessary to transmit the image Request to Send in the suitable transmitting conditions over the camera for actuation to suitable timing. Moreover, the information inputted by S52 does not need to be a password and an actuation user name, and may be the address of the user name which logs in without inputting anew, and/or its computer.

[0058] With reference to drawing 16, the actuation by the side of a camera is explained. It checks whether reception of camera actuation directions is permitted to waiting (S61) and according to the demand origin by requiring agency information detection supervisory equipment 64 camera actuation when receiving (S62). When camera actuation is permitted (S62), the directed actuation is analyzed (S63) and it investigates whether the actuation is possible (S64). If it is the directions which can operate (S64), according to the contents of directions, the pan and tilt of a universal head 52 are driven to desired value at the zoom list of the image pick-up section 50 (S65), and it waits to reach desired value (S66), and it will transmit to completion acknowledge signal of directions actuation demand-origin (S67), and will wait for reception of the next camera actuation directions (S61).

[0059] In the camera actuation directions from the computer by which camera actuation is not permitted (S62), demand-error signal which shows that origin is answered (S68). Moreover, even if camera actuation is permitted, when the contents of directions of operation are unrealizable things (S64), demand-error signal which shows that origin is answered (S68). (for example, when the limitation of a pan or a tilt is crossed etc.)

[0060] It is received by S55 of drawing 15, and the completion acknowledge signal of directions actuation (S67) and an error signal (S68) are estimated by S56.

[0061] Every computer may enable it to acquire a control although only the computer beforehand defined about each camera can operate a camera by remote control in drawing 15 and drawing

16 . Drawing 17 shows the operation flow chart of a camera which granted the control to the computer which required the control early more.

[0062] It waits for reception of an acquisition demand of a camera actuation control (S71). If the acquisition demand of a camera actuation control is received (S71), it will shift to the bottom of control of the demand origin (S72), and grant of a camera actuation control will be notified to a requiring agency (S73).

[0063] Then, even if there is a control acquisition demand from other computers until the computer which had the camera control set up abandons a control (S77) (S74), a letter is answered in a control busy signal, and the purport by which the control is already set as other computers is notified (S75).

[0064] The directed actuation is analyzed to the directions of operation from the computer by which the control was set up (S76) (S78), and it investigates whether the actuation is possible (S79). If it is the directions which can operate (S79), according to the contents of directions, the pan and tilt of a universal head 52 are driven to desired value at the zoom list of the image pick-up section 50 (S80), and it waits to reach desired value (S81), and the completion acknowledge signal of directions actuation will be transmitted to the computer holding a control (S82), and it will wait for reception of the next camera actuation directions or abandonment of a control (S76, S77).

[0065] When the contents of directions of operation are unrealizable things (S79), the computer holding a control is answered in an error signal (for example, when the limitation of a pan or a tilt is crossed etc.) (S83), and it waits for reception of the next camera actuation directions or abandonment of a control (S76, S77).

[0066] If the control abandonment directions from the computer which had the camera control set up are received (S77), it will shift to the control idle state which shows that a control is free, and will wait for reception of an acquisition demand of a camera actuation control again (S71).

[0067] In drawing 17 , although all the computers were treated in the same rank about acquisition and release of a control, priority is established and a control may be made to shift to the computer of a high order to the control acquisition demand by the priority of a high order. Well-known mediation control can be used for this.

[0068] Moreover, even if there are no directions of designation of control abandonment, when a predetermined period and directions of operation are not received, you may make it release the control. Then, one computer can prevent monopolizing a control at a long period of time.

[0069] Next, as the access request (an image Request to Send and/or control demand) to a camera is counted, the example which enabled it to opt for required camera arrangement easily is explained. In this example, the internal configuration of the camera 22-1 to 22-6 which carries out direct continuation to LAN 12-1 to 12-4, 22-9, and 22-11 is changed into the configuration shown in drawing 18 from the configuration shown in drawing 4 . The same sign is given to the same component as drawing 4 . Specifically, the simpler partner address detection equipment 70 of only detecting the simpler partner address and the simpler image transmitting conditions instead of which have been accessed is formed. [requiring agency information detection supervisory equipment 64] In storage 72, the count of access of each computer other than the information memorized by storage 68 is memorized. The function of partner address detection equipment 70 as well as equipment 64 is realizable with software.

[0070] With the camera 22-10 linked to the camera 22-7, 22-8, and the computer 24-5 linked to image server equipment 26-3, equipments 54-62 and the function of 66, 70, and 72 are realized by image server equipment 26-3 and the computer 24-5.

[0071] Drawing 19 shows the outline configuration block Fig. of the image processing part of image server equipment 26-1 to 26-4. The communication controller with which 80 controls connection and a communication link with LAN 12-1 to 12-4, and 82 The video coding decryption equipment which carries out the coding decryption of the video data, and 84 The image composition processor which compounds a camera image according to the demand from a computer 24-1 to 24-5 etc., and 86 The partner address detection equipment with which the storage which consists of a hard disk drive unit, semiconductor memory equipment, etc., and memorizes image information etc., and 88 detect the address of the communications partner of

control information and image information, and 90 are system control stations which control the whole. Although it is needless to say, the function of some CCE 80, video coding decryption equipment 82, the image composition processor 84, and partner address detection equipment 88 is realizable with software.

[0072] Also in this example, a camera 22-1 to 22-11 and a computer 24-1 to 24-5 presuppose that it is arranged as shown in drawing 8 thru/or drawing 11.

[0073] The example of communication link logging information of the image Request to Send drawing 20 is remembered to be by the storage 72 of a camera C1, and drawing 21 are the examples of statistical information of the count of an image Request to Send memorized by the storage 72 of a camera C1. The same information is memorized by the storage 72 of each camera. Drawing 22 is the statistics management tables 1 and 2 according to camera of the image Request to Send by a certain computer. The data shown in drawing 22 collect the communication link logging information and the count statistical information of an image Request to Send which are memorized by the storage 72 of each camera, and total for every camera. Drawing 23 is the statistics of the count of an image Request to Send its post exception and according to camera similarly. The data shown in drawing 23 also collect the communication link logging information and the count statistical information of an image Request to Send which are memorized by the storage 72 of each camera, and total for every camera for every computer of their post unit and each post.

[0074] The actuation which acquires the count value shown in drawing 20 - drawing 23 is explained.

[0075] Drawing 24 shows the operation flow chart by the side of a camera. The requiring agency address and the image transmitting conditions that partner address detection equipment 70 is added to the image Request to Send in reception of an image Request to Send if waiting (S101) and an image Request to Send are received (S101) are detected (S102). The counter value of the image transmitting condition of the demand former address is read from storage 72, is incremented, and it stores in storage 72 again (S103). For example, when the image Request to Send in still picture mode is in a camera C1 from the computer of the address P1, the counter [of drawing 21] of the requiring agency address P1 of a transmitting-mode:still picture is increased one.

[0076] Moreover, additional record of the logging information, such as image transmitting time of day, the image Request-to-Send former address, and an image transmitting mode, is carried out at the image transmitting logging storage area of storage 72 (S104), and image transmission is started.

[0077] That is, when an image transmitting mode is still picture transmission, one frame outputted from (S105) and the image pick-up section 50 is incorporated (S106), and as occasion demands, it encodes with video coding equipment 60, and transmits (S107).

[0078] the time of an image transmitting mode being an animation transmitting mode -- (S105) -- so -- between Nobutoki -- setting up (S108). Incorporation of the photography image by the image pick-up section 50, coding, and transmission are repeated between the air time (S109, S110, S111).

[0079] Drawing 25 shows the flow chart of the collection procedure of the statistical information and logging information in a computer 24-1 to 24-5. It waits for the collection time of day of logging and statistical information (hereafter, it omits and is described as a log.) to come (S121). It is independently set as what time interval or which time of day whether logs are collected. If collection time of day comes (S121), the address of the camera for collection will be set up (S122), and a log collection demand will be transmitted to the addressing to a camera (S123). The camera which received this log collection demand is transmitted to demand-logging and statistical information memorized to storage 72 origin. A computer makes the contents of waiting (S124) and the log which received reflect reception of the log from the corresponding camera in the statistical information of the camera (S125). For example, it asks for every camera of the image Request-to-Send statistics management table 1 classified by camera shown in drawing 22, the count counter for every transmitting mode, every camera of Table 2 and the count counter for every image Request-to-Send demand former group, and the count counter

according to every demand origin of the count statistics management tables 1 and 2 of the image Request to Send classified by group shown in drawing 23 , and camera.

[0080] Processing of S122-S125 is performed about the camera which is all or was specified (S126).

[0081] If it judges whether there is any display demand of statistical information (S127) and there is a display demand after log collection is completed (S126) (S127), the specified statistical information will be displayed (S128). If there is no display demand, it will wait for the next log collection time of day (S121).

[0082] Although the example as which log collection time of day is specified beforehand was explained, it collects and you may make it display, of course according to directions of a user. It cannot be overemphasized it not only displays these statistics results, but that it is memorizable to storage with a user's hope.

[0083] Drawing 26 shows the operation flow chart at the time of using image server equipment 26-1 to 26-4. It waits to receive the image Request to Send of the jurisdiction camera from a computer 24-1 to 24-5 (S131). If the image Request to Send of a jurisdiction camera is received (S131), partner address detection equipment 88 will detect the requiring agency address, an image Request to Send will be analyzed with a system control station 90, and an image transmitting mode will be checked (S132). On storage 86, the statistical information applicable to the demand former address and an image transmitting mode is updated, and additional record of the logging information is carried out (S133).

[0084] Image transmitting preparation of an applicable camera investigates whether it is O.K. (S134), and if it cannot be preparing (S134), the image from an applicable camera is acquired (S135), and it transmits to a requiring agency through a communication controller 80 and LAN as occasion demands, encoding with video coding decryption equipment 82 (S136). Moreover, when image transmitting ready [the applicable camera], (S134) and its image data are transmitted to a requiring agency through a communication controller 80 and LAN as occasion demands, encoding with video coding decryption equipment 82 (S136).

[0085] S134-S136 are repeated until it should carry out transmitting termination (S137).

[0086] In drawing 20 - drawing 23 , it is clear that an example of the statistical information and logging information actually memorized and collected may be shown, and the information on other may be memorized and collected.

[0087] Although a camera side answers a letter in log information according to the collection demand of log information, when the amount of stored data exceeds a predetermined value periodically, it is clear that you may make it transmit to which computer or server etc. which makes LAN connection.

[0088] In the above-mentioned example, it is also clear that a computer 22-4 to 24-5 can serve as the function of the image server 26-1 to 26-4.

[0089]

[Effect of the Invention] According to this invention, there is the following effectiveness so that he can understand easily from the above explanation. That is, the image of the camera of arbitration can be acquired through data networks, such as LAN, and the camera of arbitration can be operated by remote control. To the camera which can change photography bearing or a photography scale factor freely, it is specifying or presetting a photography field, and the image of the photography field of arbitration can be acquired. By these, the cheap image transmission system which connects organically two or more image input means and two or more image output means can be offered.

[0090] Moreover, even if the camera is controlling by establishing the means which carries out the are recording storage of the photography image, a photography image can be immediately gained now and the good comfortable image transmission system of a response can be offered.

[0091] Since the concurrency control of the camera by two or more users is eliminated, derangement of camera control can be prevented. Furthermore, since it notifies that the control is set as others to the control demand to the camera with which other users already hold a control, the derangement about acquisition of a control is avoidable.

[0092] By totaling the access situation of a camera, it can judge now modification and an

addition of the installation of a camera appropriately, and a camera not only can carry out effective arrangement, but is made as for network capacity allocation to a suitable thing. By leaving these managements to image server equipment, the costs of a camera are made to a cheap thing.

[Translation done.]

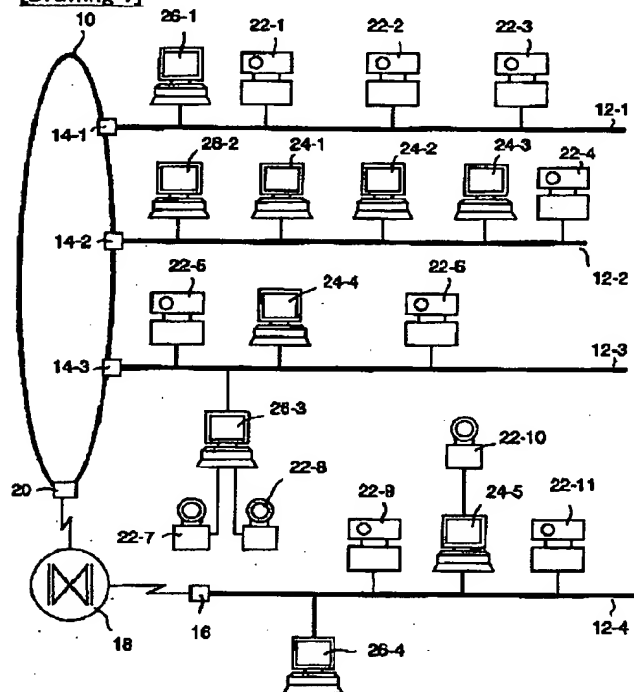
* NOTICES *

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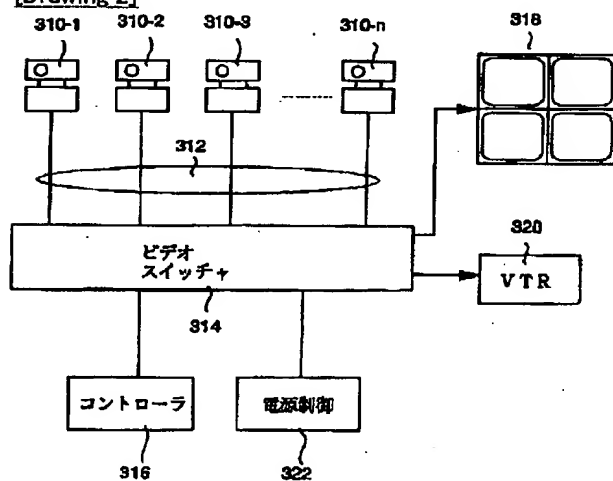
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. *** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

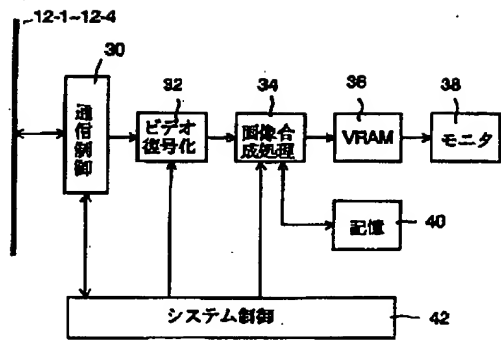
[Drawing 1]



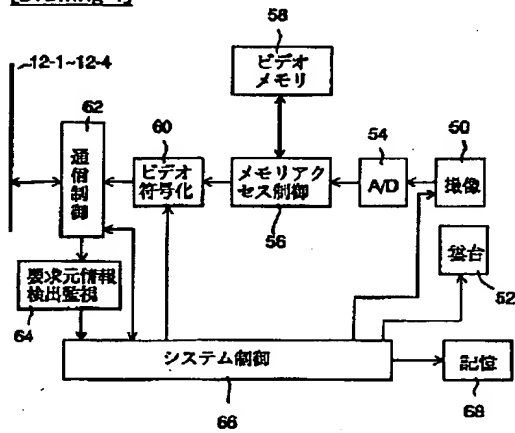
[Drawing 2]



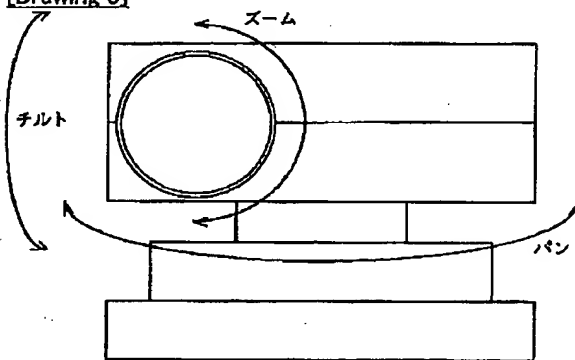
[Drawing 3]



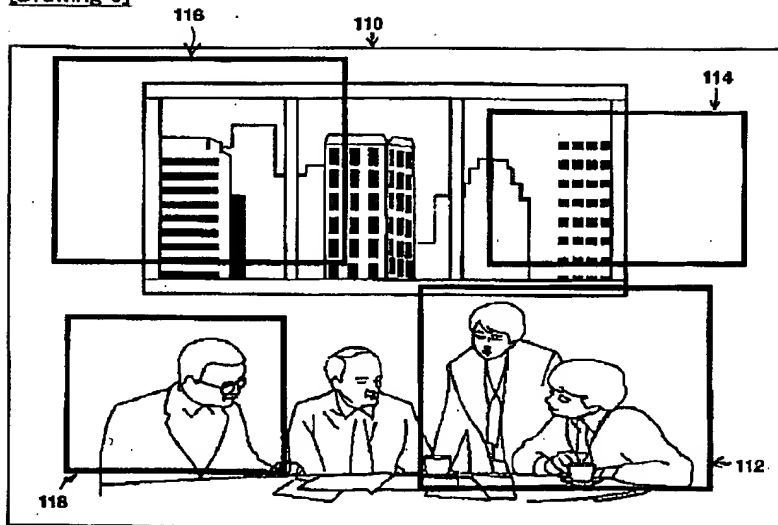
[Drawing 4]



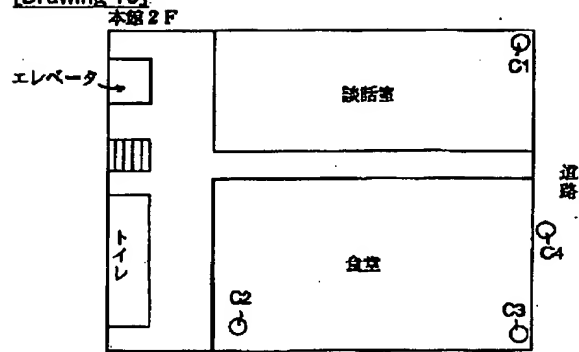
[Drawing 5]



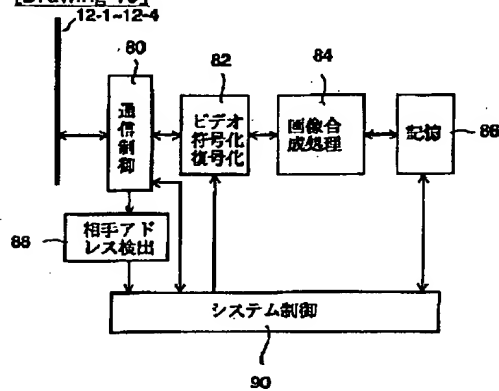
[Drawing 6]



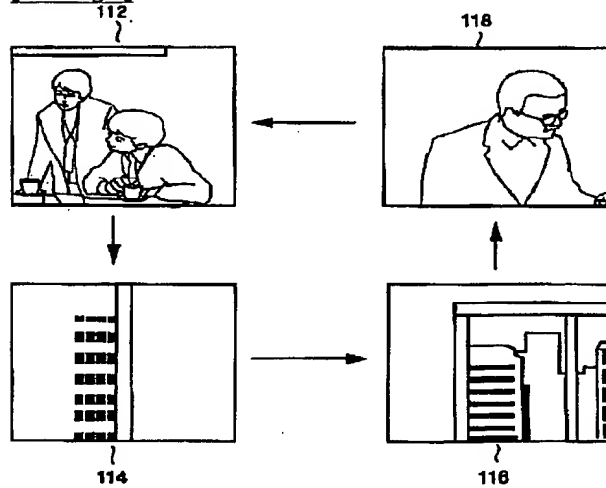
[Drawing 10]



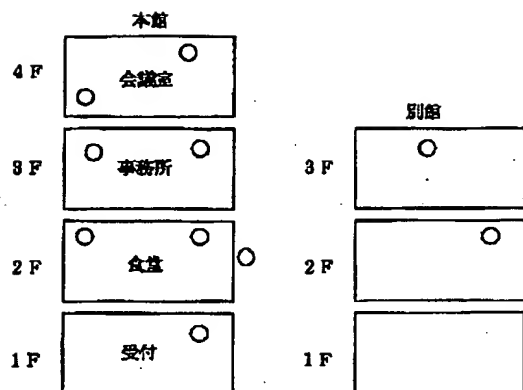
[Drawing 19]



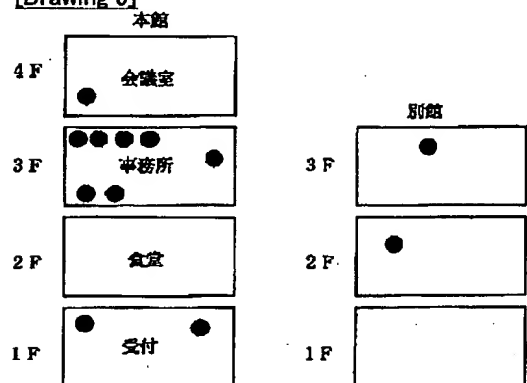
[Drawing 7]



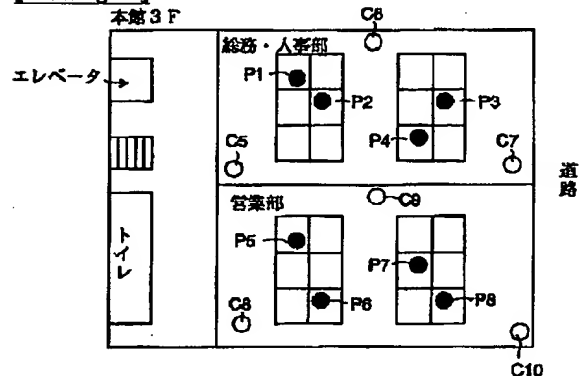
[Drawing 8]



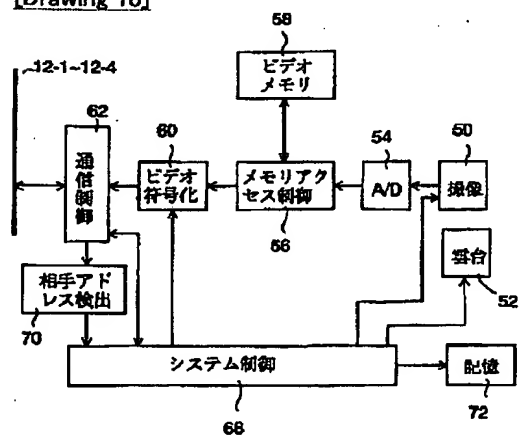
[Drawing 9]



[Drawing 11]



[Drawing 18]

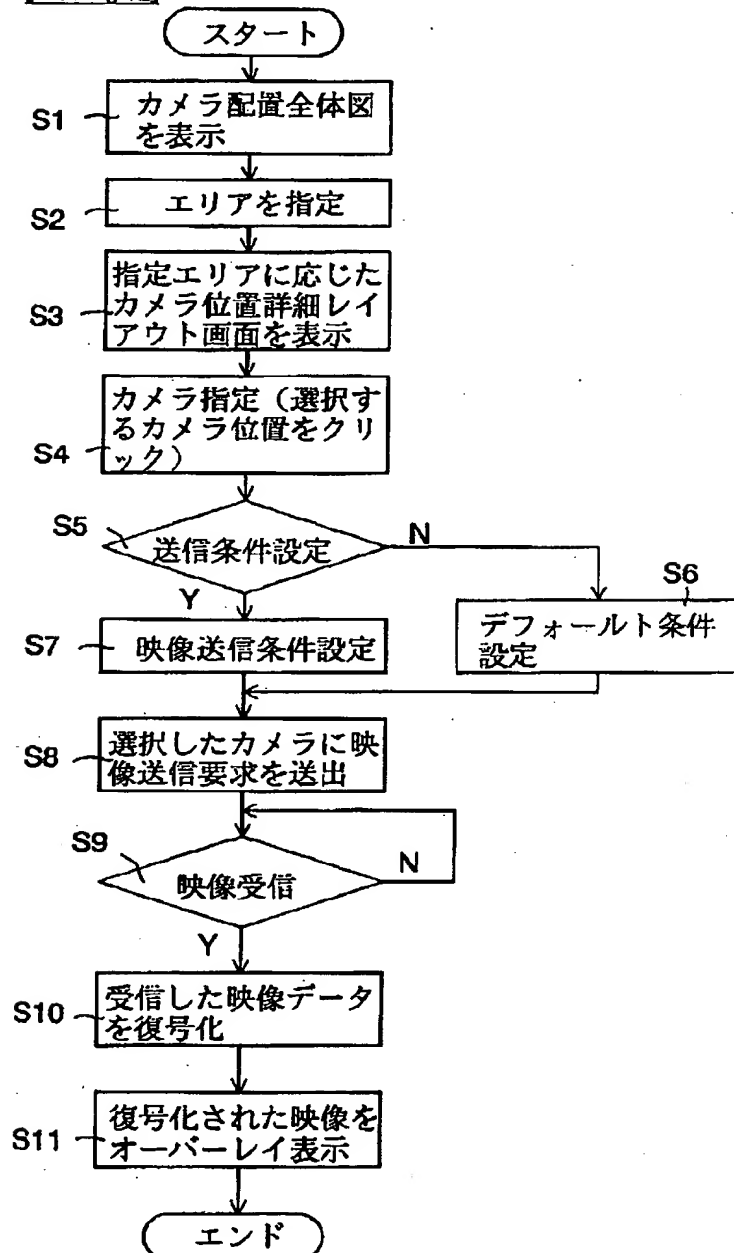


[Drawing 20]

カメラC1 映像送信要求ロギング

送信時刻	要求元アドレス	映像送信モード
9:03	P6	静止画1フレーム
9:51	P7	静止画5フレーム
11:30	P1	動画1分
⋮	⋮	⋮

[Drawing 12]



[Drawing 21]

カメラC1 映像送信要求回数

要求元アドレス	映像送信モード	回数
P1	静止画	5
	動画	0
P2	静止画	11
	動画	0
P3	静止画	0
	動画	1
⋮	⋮	⋮

[Drawing 22]

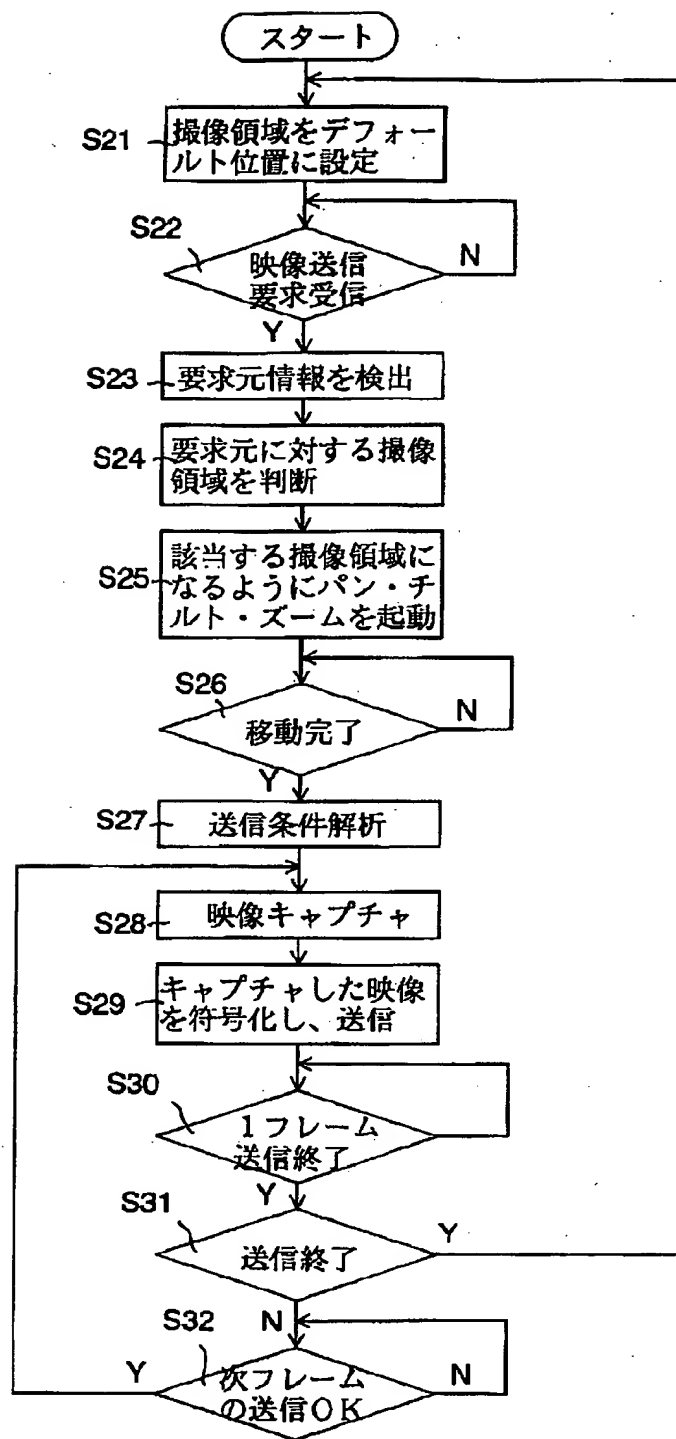
カメラ別映像送信要求統計管理表 1

カメラ	映像送信モード	回数
C1	静止画	51
	動画	0
C2	静止画	101
	動画	0
C3	静止画	1
	動画	12
⋮	⋮	⋮

カメラ別映像送信要求統計管理表 2

カメラ	要求元グループ	回数
C1	営業部	51
	人事部	41
	総務部	12
	⋮	⋮
C2	営業部	0
	人事部	0
	⋮	⋮
⋮	⋮	⋮

[Drawing 13]



[Drawing 23]

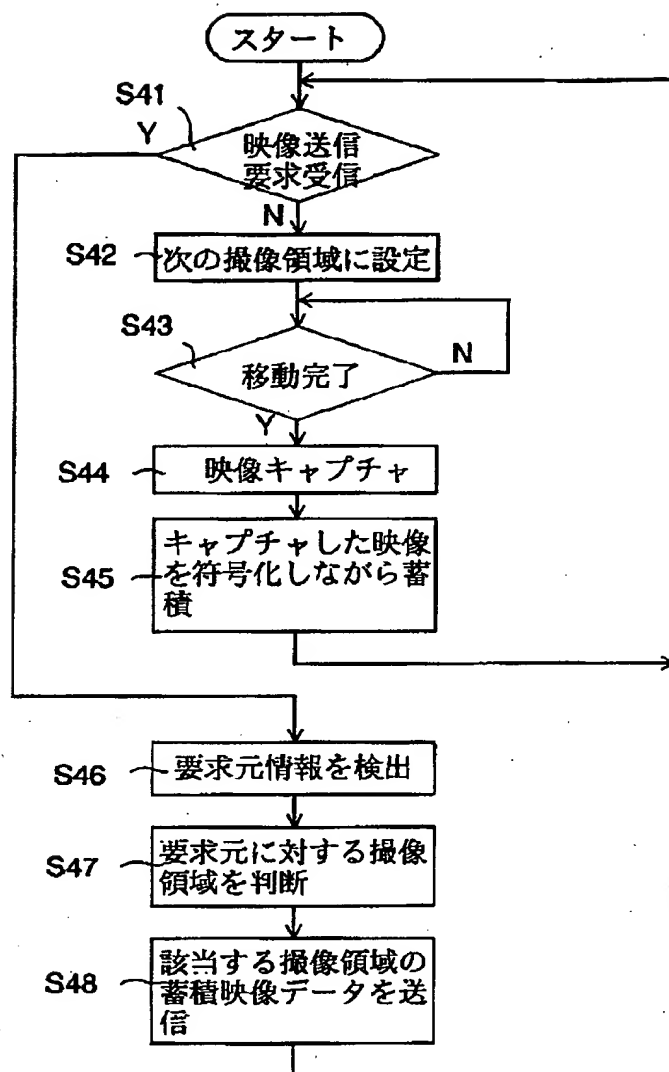
グループ別映像送信要求回数統計管理表1

要求元グループ	カメラ	回数
営業部	C1	5
	C2	0
	C3	15
	⋮	⋮
人事部	C1	41
	C2	0
	C3	5
	⋮	⋮
⋮	⋮	⋮

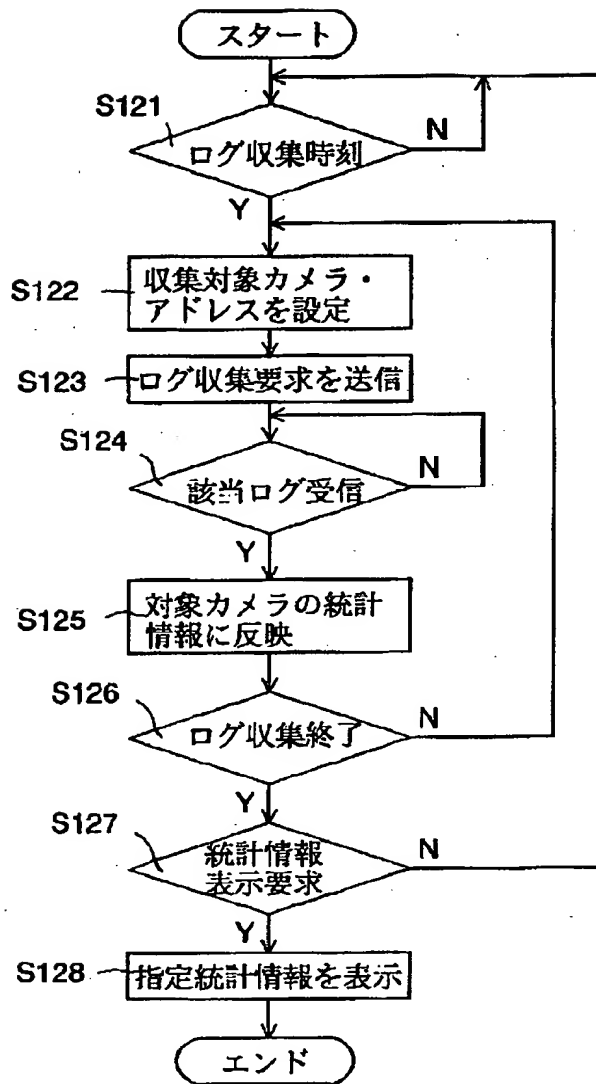
グループ別映像送信要求回数統計管理表2 (詳細)

要求元	カメラ	回数
人事部 P1	C1	1
	C2	0
	C3	3
	⋮	⋮
人事部 P2	C1	5
	C2	0
	⋮	⋮
⋮	⋮	⋮

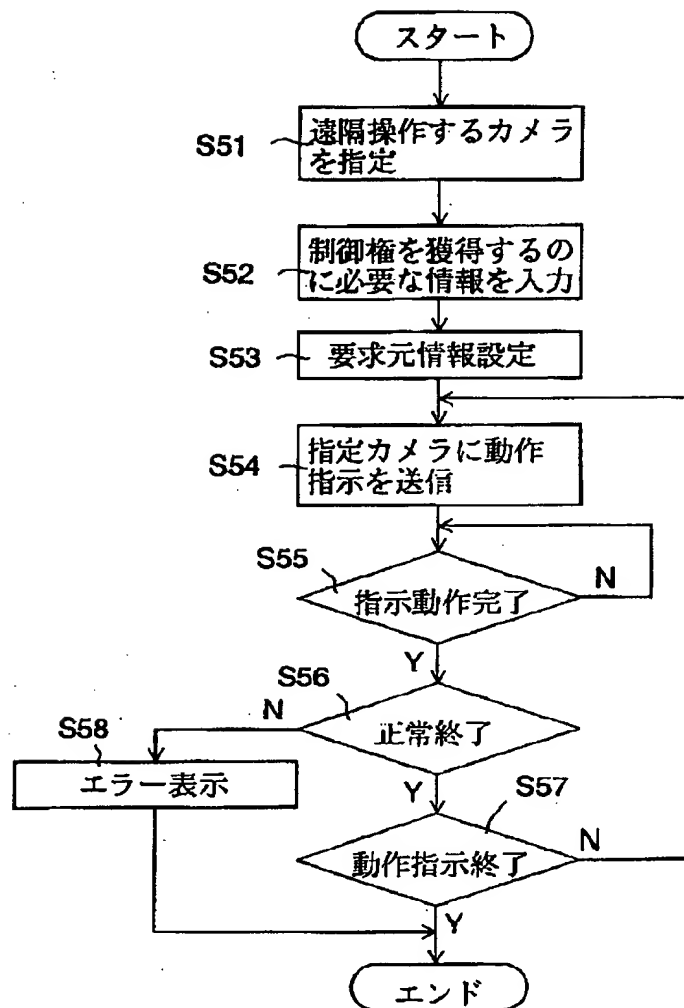
[Drawing 14]



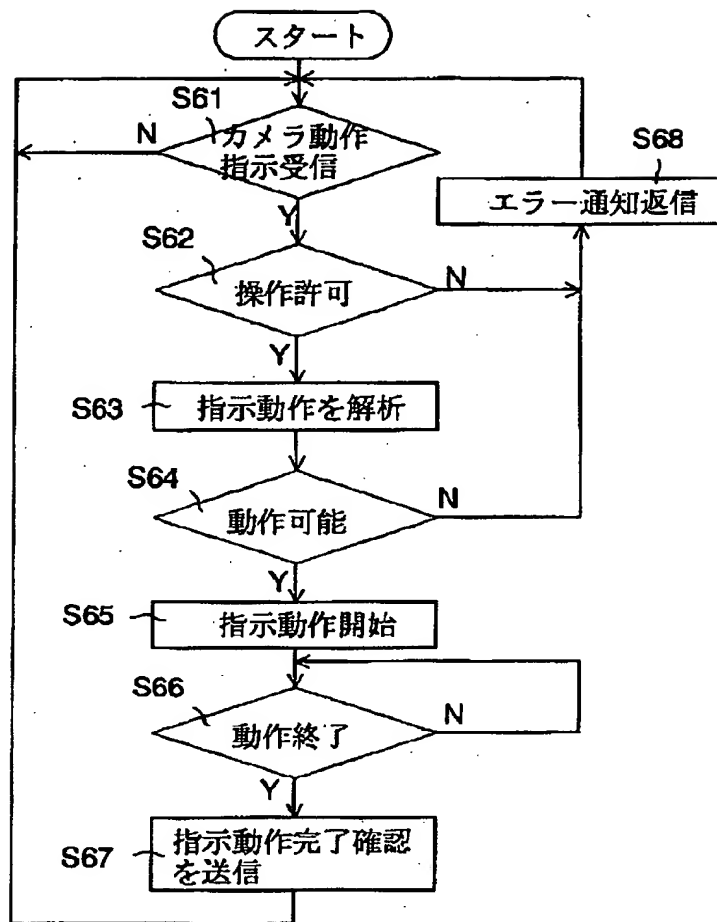
[Drawing 25]



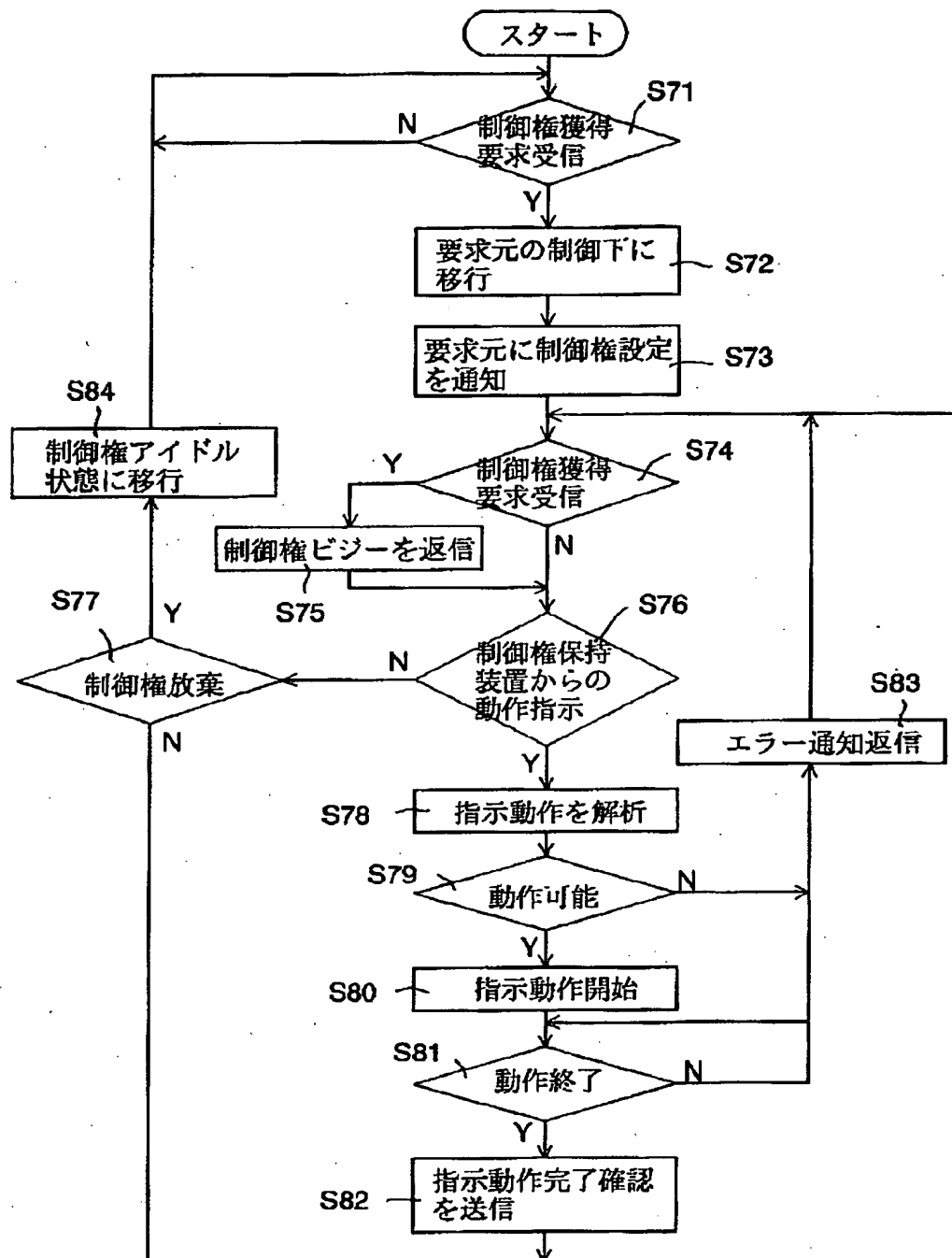
[Drawing 15]



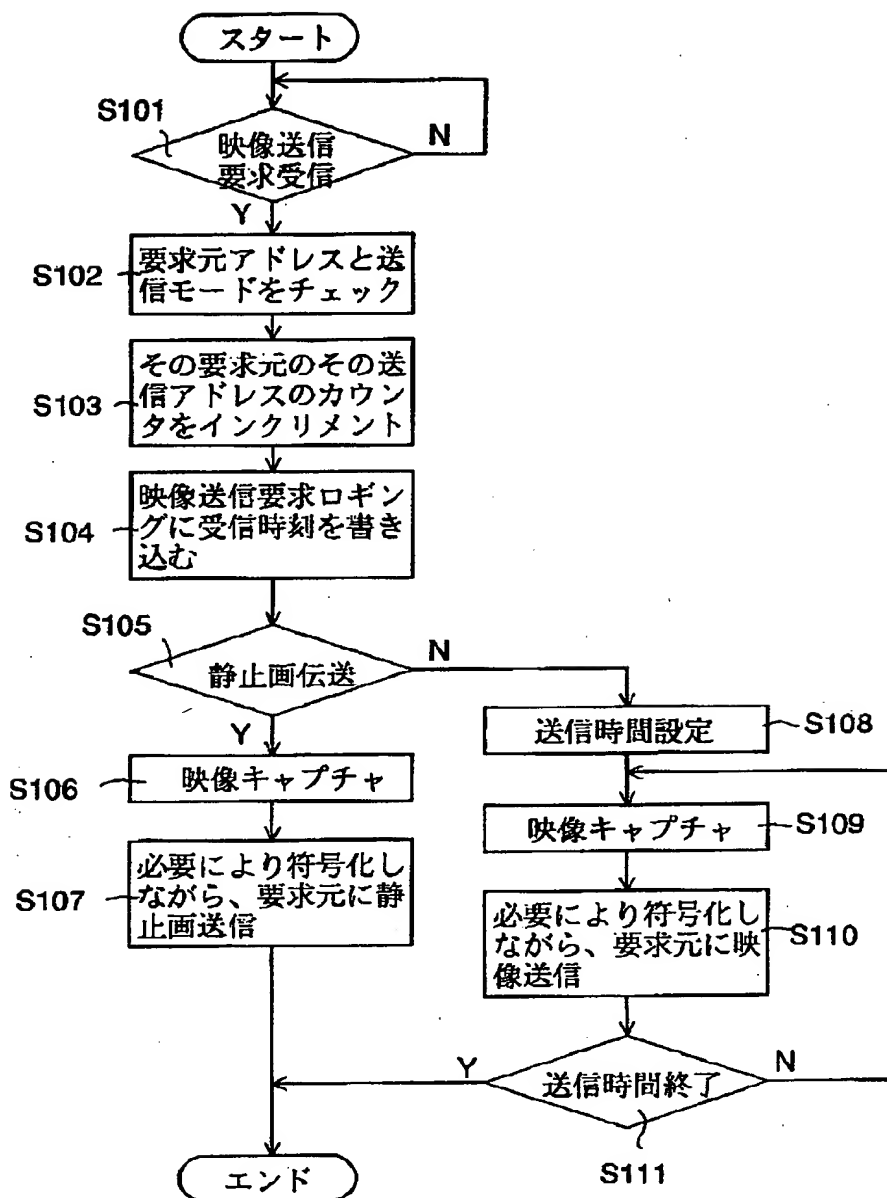
[Drawing 16]



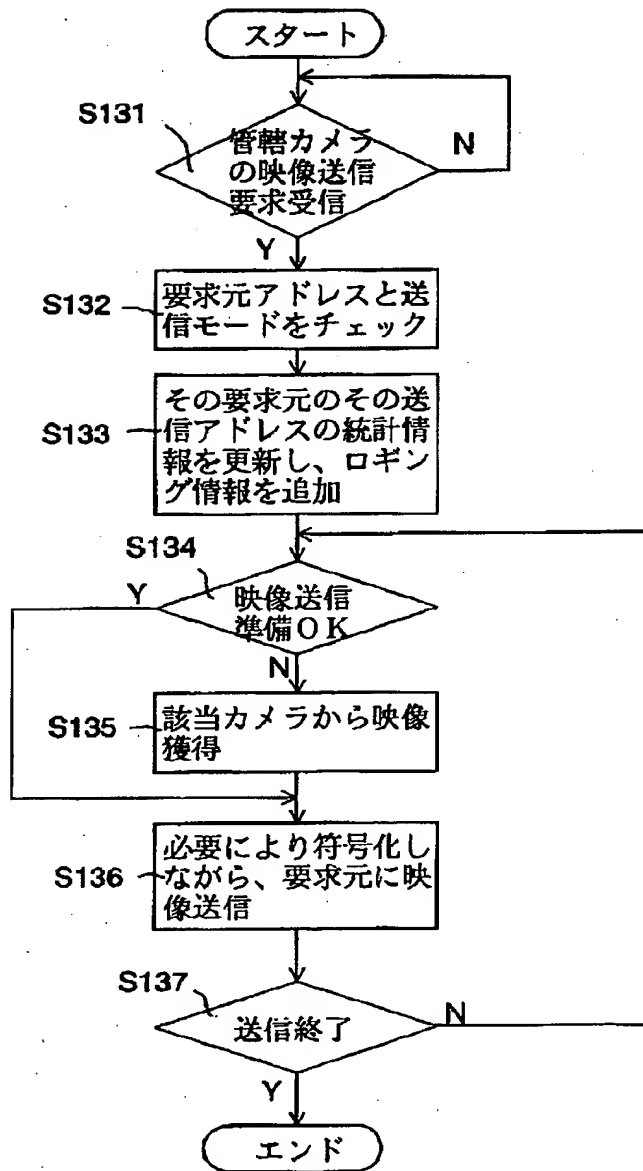
[Drawing 17]



[Drawing 24]



[Drawing 26]



[Translation done.]